Topics in Primary Care Medicine

Pharyngitis

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"Topics in Primary Care Medicine" presents articles on common diagnostic or therapeutic problems encountered in primary care practice. Physicians interested in contributing to the series are encouraged to contact the series' editors.

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Although most persons with pharyngitis do not consult physicians, sore throat is one of the most common reasons for office visits. The challenge is to define the subgroup of patients who merit more than nonspecific symptomatic treatment.

Two interrelated management questions should be considered: Should a throat culture be carried out? Should an antibiotic be prescribed?

The answer to these questions depends on the goal of the proposed therapy. In the past, concern about the prevention of rheumatic fever has been the main impetus for the antibiotic treatment of pharyngitis. Other goals are symptom relief, prevention of suppurative complications and prevention of disease transmission. This article will discuss the approach to streptococcal pharyngitis and briefly consider the treatment of other, nonviral causes of pharyngitis, such as gonorrhea or *Mycoplasma*.

Prevention of Rheumatic Fever

In the early 1950s, penicillin treatment of group A streptococcal pharyngitis was shown to prevent initial and recurrent attacks of rheumatic fever. For this reason, the American Heart Association in the past recommended that all patients complaining of sore throat receive a throat culture. If the culture was positive, antibiotics could be given. Waiting several days for culture results before treating was shown not to interfere with rheumatic fever prevention.

Rheumatic fever and its sequelae were once significant causes of debility and death among children and young adults in the United States. But over the last 30 years the attack rate of rheumatic fever has dramatically declined. In most areas of the country, the incidence rate is no more than one to two cases per 100,000 population per year. Indeed, when medical records of patients with rheumatic fever are reviewed, as in Rhode Island, most had either an asymptomatic infection or did not consult a physician despite symptoms. Although children and young adults of lower socioeconomic status from urban areas in the continental United States are felt to be at greater risk, the incidence of rheumatic fever has also declined in many of these areas. For example, the incidence of rheumatic fever among inner city black children in Memphis is fewer than four cases per 100,000. In other areas of the world and in a few areas of the United States, acute rheumatic fever and rheumatic heart disease remain important clinical problems. For example, among Samoan children on the main Hawaiian island of Oahu, the incidence of rheumatic fever is close to 100 cases per 100,000.

The explanation for the decline of rheumatic fever is not known. The downward trend began well before the introduction of penicillin, but widespread antibiotic therapy may have played an additional role. Other factors may be changes in the ecology of the streptococcal organism and improved living and nutritional standards.

For most patients in the United States now, the risks of preventing rheumatic fever by antibiotic treatment of streptococcal pharyngitis approximate the risks of acquiring rheumatic fever. There is a 1 in 200 chance that a patient receiving penicillin will have a drug reaction and a 2 in 100,000 chance of fatal anaphylaxis.

By contrast, group A streptococcal pharyngitis remains a common disease. Of 21,150 throat cultures done between December 1980 and February 1981 by the Rhode Island Department of Health, 17% were positive. The largest percentage of positives were in children and young adults.

Streptococcal Pharyngitis

Common but not specific features of streptococcal pharyngitis are sudden onset of sore throat, accompanied by fever, malaise and headache. In children, there may be nausea, vomiting and abdominal pain. Physical findings may include pronounced inflammation of the throat and tonsils, a discrete patchy exudate and anterior cervical adenopathy. Conditions

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that may be associated with streptococcal pharyngitis include scarlet fever and acute glomerulonephritis. Other signs and symptoms, such as conjunctivitis, cough, diarrhea, nasal discharge, hoarseness, stomatitis and bullous myringitis, are unusual and suggest another cause of pharyngitis.

Exudative pharyngitis can be caused by other conditions, including viral infections. Persistent systemic illness, lymphadenopathy and splenomegaly suggest the diagnosis of infectious mononucleosis. Diphtheria is uncommon but still occurs in unvaccinated populations. It is characterized by a grey membrane that is firmly adherent to the tonsillar or pharyngeal mucosa.

Streptococcal Throat Cultures

Throat cultures for streptococci in some laboratories cost as much as $20. They utilize a blood agar plate, with neomycin and nalidixic acid added. Colonies which show β-hemolysis are identified as group A or non-group A by disk tests, fluorescent antibody staining or latex agglutination. Non-group A streptococci can cause clinically significant pharyngitis, but not rheumatic fever.

A positive throat culture for group A β-hemolytic streptococci may reflect infection with or asymptomatic carriage of streptococci in the oropharynx. In children the streptococcal carriage rate may be as high as 15%. In one study approximately half of children with pharyngitis were infected and half were carriers. The false-negative rate of a single throat culture in infected patients is about 10%.

The concept of "prior probability"—the likelihood a patient will have a streptococcal infection based on the history and physical examination findings—is helpful in assessing the value of a throat culture. As the prior probability of streptococcal infection increases, the culture becomes less valuable because the results may have little effect upon therapy. Similarly, as the prior probability of infection decreases, the culture becomes less valuable because a positive culture likely represents a carrier state unrelated to the pharyngitis. The culture is most valuable in guiding therapy when the prior probability of infection is intermediate.

The carrier state does not appear to be a significant risk factor for the development of clinical pharyngitis or rheumatic heart disease, except in patients with prior rheumatic fever. Nor is it a significant risk factor for disease transmission. Indeed, patients who cannot be "cured" of oropharyngeal streptococci with repeated courses of antibiotics are most likely to be chronic streptococcal carriers, not acutely infected persons.

Few medical authorities have adopted a "no culture" approach to patients with acute pharyngitis. The reasons for this include the tremendous publicity given to rheumatic fever prevention programs, public expectations about the care of sore throat and the difficulty of distinguishing viral from streptococcal infections by clinical examination. Seeking medical attention for a throat culture may also be helpful in excluding suppurative complications and in providing reassurance and symptomatic relief.

The American Heart Association revised its recommendations for throat cultures in 1984. Throat cultures are said to be "valuable" for children and adolescents and "not as essential" for older patients. They are indicated primarily to avoid the unnecessary use of antibiotics for the 70% to 80% of adults with viral or other types of pharyngitis. Follow-up throat cultures, according to the new recommendations, are not indicated unless the patient remains symptomatic. Cultures of asymptomatic family members and contacts should be reserved for special circumstances, such as in the family of a patient with a history of rheumatic fever or in an epidemic.

New Rapid Diagnostic Tests for Streptococci

Rapid diagnostic tests, involving direct identification of group A streptococci from throat swabs using fluorescent antibody staining, latex agglutination tests or an enzyme-linked immunosorbent assay, are an alternative to a throat culture. There is an expanding number of such tests, which can be carried out in an office setting. The cost of materials is about $2 a test and results can be obtained in less than two hours.

Published reports indicate test sensitivities of 77% to 95% (compared with throat cultures) and test specificities of 86% to 100%. Cases missed are primarily those of streptococcal carriers, who tend to have lower colony counts. There is probably little significance to missing these carriers. The advantages of these tests are rapid diagnosis, less expense, immediate patient knowledge and reassurance, and avoidance of unnecessary antibiotics. The disadvantages include their lack of sensitivity, the time required to do the test and maintain quality control and the need for more time to confirm their reliability. To date, no one of these new tests is substantially more sensitive or more specific than another.

Treatment of Streptococcal Pharyngitis

Children over the age of 3 and young adults with a combination of sore throat, exudative pharyngitis, temperature greater than 37.8°C (100°F) and anterior cervical adenopathy have a significant chance—probably greater than 40%—of streptococcal infection. While viral pharyngitis could also produce these clinical features, the physician should consider empiric antibiotic therapy. Such treatment probably decreases the chance of suppurative complications such as painful adenopathy and peritonsillar abscess. A throat culture is not necessary in most cases because it would not influence the management strategy. Effective antibiotic regimens are penicillin V, 250 mg given orally three or four times a day for ten days, or benzathine penicillin G, 1.2 million units given intramuscularly. For a patient with penicillin allergy, erythromycin, 250 mg four times a day for ten days, is suggested. Cephalosporins are also effective, but are more expensive. Oral treatment is safer than intramuscular therapy. An injection is preferred only if poor compliance is anticipated, a rheumatic person is in the family or in the rare clinical settings where rheumatic fever is more likely. Prevention of recurrent attacks of rheumatic fever in patients with a history of the disease is a separate topic beyond the scope of this article.

Patients with a sore throat but no other features of streptococcal pharyngitis are unlikely—have less than a 5% chance—to have the disease. A throat culture is not necessary. Patients with sore throat and one or two features, such as temperature, exudate or adenopathy, have an intermediate chance. A throat culture may be useful to avoid unnecessary antibiotic use and provide reassurance to the patient.

Symptomatic Relief of Pharyngitis

Streptococcal pharyngitis is a self-limited disease usually lasting less than five days. Several studies from the 1950s suggest that if patients are treated with antibiotics within 24 hours of the onset of symptoms the duration of symptoms *may* be decreased by 12 to 24 hours. Recently, a small, prospective, double-blind study showed a significant symptomatic response of children to penicillin initiated within 72 hours of the onset of streptococcal pharyngitis, compared with placebo. It will be important to learn if this finding is confirmed in other patient groups.

The use of antibiotics for relief of symptoms in patients unlikely to have streptococcal pharyngitis or another bacterial cause of pharyngitis should be discouraged. Over-the-counter lozenges, saline gargles, aspirin or a mild narcotic for severe pain may be efficacious. Patients who smoke should be encouraged to stop.

Physician Practices

Recent evidence suggests that there may be excessive throat culturing and antibiotic use for patients who complain of sore throat. This conclusion is based on the results of a survey in 1981 of the culturing and prescribing patterns of all active primary care physicians in Rhode Island. About half the physicians surveyed obtained a throat culture on all patients with sore throat, regardless of clinical features or therapeutic plan. Close to 90% said they provided antibiotic therapy before culture results were obtained and only 60% stopped the antibiotics if the culture was negative. Nearly half said they often did not receive culture results in time to influence therapy. Two of five physicians obtained follow-up throat cultures after the completion of therapy. This survey suggests that much progress is necessary to achieve a goal of selective culturing and antibiotic treatment, as now recommended by the American Heart Association. Further, this selective strategy offers an opportunity to both reduce the costs of medical care and avoid unnecessary antibiotic use.

Gonococcal Pharyngitis

Gonococcal pharyngitis may occur in sexually active populations. It is particularly prevalent among gay men. The symptoms are usually very mild, with infrequent tonsillar or cervical node enlargement or tonsillar exudate. There may be evidence of gonorrhea at other sites or of disseminated infection.

A careful sexual history is necessary to determine those patients at risk for pharyngeal gonorrhea. There is controversy about the role of pretreatment and follow-up throat cultures. There are limited data and no large randomized trials of therapy. Recommended antibiotics include tetracycline (500 mg given orally four times a day for seven days), procaine penicillin (2.4 million units intramuscularly in each buttock after probenecid, 1 gram orally) or trimethoprim-sulfamethoxazole (nine single-strength—80 mg/400 mg—tablets orally each day for five days). Administering spectinomycin hydrochloride is ineffective.

Chlamydial and *Mycoplasma* Pharyngitis

Clinicians are now focusing attention on other potentially treatable causes of pharyngitis. In a study of 763 adults with sore throat seen in four general medical practices in New England, Komaroff and his colleagues found serologic evidence of infection with *Chlamydia trachomatis* in 20.5% and with *Mycoplasma pneumoniae* in 10.6%. Only 9.1% of patients had positive cultures for group A β-hemolytic streptococci; 17.7% had viral infections and 2% were heterophile-positive. Significantly, no pathogenic organism was identified for many patients. It will be important to confirm these findings in other patient groups.

The study did not address the value of treatment. Based upon its findings, however, erythromycin, to which group A β-hemolytic streptococci, *Mycoplasma* and *Chlamydia* are sensitive, would seem a reasonable antibiotic choice in patients with persistent pharyngitis or in other circumstances leading to empiric therapy.

Summary

Patients at high risk for streptococcal pharyngitis or its suppurative complications should receive antibiotic treatment without throat cultures. Such patients usually have sore throat, fever, anterior cervical adenopathy and pharyngeal exudate. Patients with sore throat and no fever, adenopathy or exudate are unlikely to have streptococcal pharyngitis. They should usually receive symptomatic treatment only. Intermediate-risk patients should receive throat cultures; antibiotics should be withheld until culture results are known. Further research is needed to assess the value of penicillin treatment for symptomatic relief of such patients. Follow-up cultures and routine cultures without symptoms are rarely indicated. Gonococcal pharyngitis should be considered in persons at risk. Finally, some patients may have pharyngitis secondary to *Chlamydia* or *Mycoplasma*. Erythromycin may be effective in treating these patients.

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